Published in final edited form as:

Acad Pediatr. 2013 ; 13(2): 152–158. doi:10.1016/j.acap.2012.12.004.

Weight Change in Pediatric TennCare Recipients Referred to a Commercial Weight Loss Program

Nia S. Mitchell, MD, MPH, Christina A. Suh, MD, MPH, Nanette Stroebele, PhD, James O. Hill, PhD, and Adam G. Tsai, MD, MSCE

Division of General Internal Medicine, University of Colorado Anschutz Medical Campus (Drs Mitchell and Tsai), Colorado Health Outcomes, University of Colorado Anschutz Medical Campus (Dr Mitchell), Department of Pediatrics, University of Colorado Anschutz Medical Campus (Drs Suh, Stroebele, and Hill), Department of Nutritional Psychology, Institute of Nutritional Medicine (Dr Stroebele), and Anschutz Health and Wellness Center, University of Colorado Anschutz Medical Campus, Stuttgart, Germany (Drs Mitchell, Stroebele, Hill, and Tsai)

Abstract

Background—The epidemic of overweight and obesity in the United States is not limited to adults but also affects children and adolescents. Low-income children are disparately affected because they have an elevated risk for developing obesity. Effective interventions are urgently needed to prevent and treat obesity in children. In 2006, Tennessee Medicaid (TennCare) and Weight Watchers formed the TennCare Weight Watchers Partnership Program, which allowed pediatric recipients to attend Weight Watchers with no out-of-pocket cost.

Methods—This study is a nonconcurrent prospective analysis of administrative data from the TennCare Weight Watchers Partnership Program. It examined the weight change of TennCare beneficiaries between the ages of 10 and 17 who participated in the program from January 2006 to January 2009 and compared the weight change to the recommendations of the Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Childhood and Adolescent Overweight and Obesity.

Results—Fifty-three percent of participants either met or exceeded the recommendations of the panel on childhood obesity at the end of their involvement in the program. Participants who attended the program for more than 12 weeks and those who attended 10 or more meetings had a 5% decrease in their body mass index z score.

Conclusions—The TennCare Weight Watchers Partnership Program was successful in helping a majority of children and adolescents who participated to meet or exceed the Expert Committee's recommendations. This type of partnership can give children in low-income families the opportunity to participate in a structured program with a good chance of success.

Address correspondence to Nia S. Mitchell, MD, MPH, Anschutz Health and Wellness Center, University of Colorado Anschutz Medical Campus, Mail Stop C263, 12348 E Montview Blvd, Aurora, CO 80045 (Nia.Mitchell@ucdenver.edu)..

Supplementary Data

Supplementary data related to this article can be found online at <http://dx.doi.org/10.1016/j.acap.2012.12.004>.

Keywords

Medicaid; obesity; overweight; pediatric; weight management

THE EPIDEMIC OF overweight and obesity in the United States is not limited to adults but affects children and adolescents as well. Data from the National Health and Nutrition Examination Survey 2009–2010 showed that 15.2% of children between the ages of 12 and 19 were overweight, and an additional 18.4% were obese.¹ Low-income children are disparately affected because they have an elevated risk for developing obesity, compared to children in higher-income households.^{2,3} Higher rates of obesity among low-income children may be caused or exacerbated by unhealthy dietary habits such as frequent intake of calorie-dense, high-fat foods and of sweetened beverages,^{4,5} and limited opportunities for daily physical activity.⁶ If left untreated, obesity in childhood and adolescence is highly likely to track into adulthood,^{7–9} putting an obese child at higher risk of developing obesity-related comorbidities, such as cardiovascular disease and type 2 diabetes, compared to their normal-weight peers. Effective interventions are urgently needed to prevent and treat obesity in children.

The state of Tennessee has struggled with high rates of obesity in children and adults. In 2007, data from the National Children's Health Survey indicated that 36.5% of Tennessee children between the ages of 10 and 17 were either overweight or obese,¹⁰ which was the fifth highest in the country at that time,¹¹ while the Behavioral Risk Factor Surveillance System Survey data showed that 67.4% of adults were overweight or obese.¹² Although there are no state-level estimates of obesity-related health care spending for children, we estimate that the Tennessee Medicaid managed care program for low-income families, also known as TennCare, spent 724 million dollars on obesity-related medical conditions in obese adults in 2006.^{13,14}

In 2006, TennCare and Weight Watchers (WW) formed a novel partnership to help treat obesity in the state. The TennCare Weight Watchers Partnership Program¹⁵ was a contract between TennCare managed care organizations and WW franchises. Overweight or obese TennCare recipients under the age of 21 were allowed to attend the program with no out-of-pocket cost, while adults who qualified for the program paid a \$1 copayment for each meeting they attended.

Weight Watchers is an international, commercial weight loss program that was started in 1963. It was the first commercial program to sponsor a randomized trial, in which participants lost 4.3 kg after 1 year and maintained a weight loss of 2.9 kg after 2 years.¹⁶

The purpose of this study was to assess the partnership between TennCare and the WW program by evaluating the weight change of participants aged 10 to 17 years who were referred by their health care providers to help manage their weight.

Patients and Methods

Study Design

This study is a non-concurrent prospective cohort analysis of administrative data from the TennCare Weight Watchers Partnership Program. Specifically, it examined the weight change of TennCare beneficiaries between the ages of 10 and 17 who participated in the program from January 2006 to January 2009. We hypothesized that individuals who participated in the program would have a reduction in body mass index (BMI) z score significantly greater than 0 and that there would be no difference in the reduction in BMI z score between boys and girls. As secondary analyses, we also determined if there was a threshold of participation, in duration or number of meetings, which might be associated with clinically significant weight loss; and we compared the weight change to the recommendations of the Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Childhood and Adolescent Overweight and Obesity.⁹

Data Source and Collection

Data were sent to the Division of Quality and Oversight of TennCare on a quarterly basis. There were no standardized protocols for height and weight measurement. Heights were self-reported by program participants and recorded only at the first visit in whole inches. Weights were collected by WW during weekly weigh-ins, just as they would be in any community WW meeting and the precision of the data varied from 0.2- to 1-pound increments (0.09- to 0.45-kg).

TennCare provided the deidentified data set for this analysis, and it included data from January 2006 through January 2009. The data source included the following variables: an identification number, height in inches, date of weigh-in, weight in pounds, age in years, and gender. The study was designated as exempt by the Colorado Multiple Institutional Review Board.

Study Participants

Study participants were TennCare beneficiaries between the ages of 10 and 17 who took part in the TennCare Weight Watchers Partnership Program. TennCare recipients between the ages of 10 and 17 were allowed to join the program if they were overweight or obese and referred by a doctor, and parents/guardians were encouraged to attend the meetings with them. TennCare covered the entire cost of the program, which was \$19 for the initial visit and \$11 for subsequent visits. The initial data set contained 360 individuals. However, 10 were excluded because they were missing data for age, gender, or height; one was excluded because the weight was too high to be changed to a BMI percentile or BMI z score by the Centers for Disease Control program; and 69 did not have a follow-up visit. Therefore, these 80 individuals were not included in the main analysis. The 69 individuals who did not have a follow-up visit were included in the sensitivity analysis. A diagram of the study inclusion is outlined in Figure 1.

Intervention

WW meetings occur weekly and last for about half an hour. There were no special meetings held for TennCare participants or adolescents. Therefore, adolescents attended meetings with adults, and possibly other adolescents. At each meeting, there is a private weigh in, an educational topic on lifestyle modification such as portion control or physical activity, and discussion of the trade-marked Points system.¹⁷ The Points system used the calories, fiber, and fat content in foods to assign a point value to each serving of food. Participants were allowed a certain number of points according to their gender and age. Points-Plus replaced the Points system in 2010.¹⁸

Outcome Measures

Weight Category and z Score—BMI percentiles and z scores were determined by SAS software (SAS, Cary, NC) of age- and sex-based BMI percentile growth charts provided by the Centers for Disease Control and Prevention.¹⁹ Children are classified as underweight, normal weight, overweight, or obese on the basis of BMI percentiles for sex on the basis of age. The classifications are as follows: underweight children are <5th percentile, normal-weight children are 5th and <85th percentile, overweight children are 85th and <95th percentile, and obese children are ≥95th percentile. Children with BMI >99th percentile were categorized as severely obese.⁹ Change in z score was calculated by measuring the difference in calculated z score from the first and last days of participation in the program.

Age—Because z scores are based on age in months, and the data set only contained age in years without dates of birth, dates of birth were approximated. We assumed that each child was their listed age plus 0.5 years old on their initial date of service, ie, a child whose age was listed as 14 on an initial date of service of June 20, 2006, was assumed to be born on December 19, 1991. In this way, all of the errors in age were equally distributed across ages.

Duration of Participation and Number of Meetings Attended—Every participant that attended at least 2 meetings was used in the analysis, and the duration of participation was based on the number of weeks between the first and last weigh-in. The duration of participation was divided into 4 categories: ≤4 weeks, >4 to ≤8 weeks, >8 to ≤12 weeks, and >12 weeks. The number of meetings attended was divided into 4 categories: 2 to 3, 4 to 6, 7 to 9, and ≥10. These are different analyses because participants could have attended the same number of meetings but over different time frames (eg, 8 meetings in 8 weeks or 8 meetings in 16 weeks).

Comparison to Expert Committee Recommendations

To compare the weight change to the recommendations of the expert committee, we categorized weight changes as loss, maintenance, or gain.⁹ Because the literature did not provide a specific definition, we developed operational definitions for each of these terms. Weight loss was defined as any final weight that was less than or equal to 1 pound lower than the initial weight; weight maintenance was defined as any final weight that was less than 1 pound above or below the initial weight; and weight gain was defined as any final weight greater than or equal to 1 pound above the initial weight.

Sensitivity Analysis

A sensitivity analysis was performed by carrying the baseline BMI z score forward for the 69 participants who had a baseline measurement but no follow-up data. The 11 participants for whom a BMI z score could not be calculated were not included in the primary or sensitivity analyses.

Statistical Methods

Data were analyzed separately by 2 strata: weight category (overweight or obese) and gender, because boys in the data set had significantly higher median z scores than girls. The Shapiro-Wilk test was used to determine if data distributions were normal. The overall comparison of the differences in z scores between first and last measurements was made using the Kruskal-Wallis test. The differences within groups were measured with Wilcoxon signed rank test. Data were divided into 4-week increments to determine if duration of participation affected the change in BMI z score. SAS software, version 9.2, was used for all analyses.

Results

Participant Characteristics

The baseline characteristics for the study participants, duration of participation, and number of meetings attended are shown in Table 1. Nearly 72% ($n = 201$) of the participants were girls. Almost 96% ($n = 268$) of the participants were classified as obese when they first started the program, 59% ($n = 165$) were severely obese, and 4% ($n = 12$) of the participants were classified as overweight. The median age of the participants was 14.5 (interquartile range [IQR] 3.0). There was no statistical difference between the age of the overweight and obese participants ($P = .12$). There was no statistically significant difference between the ratio of boys to girls in the overweight and obese categories ($P = .19$). Overall, boys had a higher median BMI z score than girls, 2.51 versus 2.34 ($P < .001$), respectively.

Duration of Participation and Number of Meetings Attended

The median length of participation was 8.5 weeks, and the range was 0.7 to 134 weeks. The median number of meetings attended was 6.0. Approximately one-fourth of participants took part in the program for each of the duration categories: 4, >4 to 8, >8 to 12, and >12 weeks.

Over 50% of participants attended 8 weekly meetings or fewer and almost 30% of participants attended 10 or more weekly meetings.

Change in z Score

The changes in BMI z scores are shown in Tables 2 and 3 and in Figure 2. When combined across all participants, median z scores were significantly lower at the last visit when compared to the initial visit ($P < .001$). Both boys and girls were equally likely to have a reduction in BMI z score ($P = .39$). However, girls had a significant change in z score in each time category, whereas boys only had a significant change when they participated for more than 12 weeks. Among girls, only those who participated for more than 12 weeks had

a significantly larger decrease in BMI z score than those who participated for shorter durations ($P = .001$ for all comparisons).

The BMI z score changed in a similar way when analyzed by the number of meetings attended. Participants who attended fewer than 10 meetings had small decreases in BMI z score, which was statistically significant only for girls. Both boys and girls who attended 10 or more meetings had a statistically significant decrease in BMI z score.

Comparison With Expert Committee Recommendations

The recommendations of the Expert Committee vary on the basis of age and weight percentile. For example, weight maintenance is recommended for some groups if their linear growth potential could allow for a change in weight category as long as their weight remained the same. Weight loss is recommended for other groups whose linear growth potential alone was unlikely to change their weight category. The weight change recommendations and categorized weight change results are summarized in Table 4. On the basis of age and BMI percentile, weight loss would be recommended for 268 participants, and 52% lost weight during the study period. Weight maintenance would be recommended for 12 participants, and 9 (75%) either maintained or lost weight. Therefore, the weight of over 53% of participants either met or exceeded the recommendations of the panel at the end of their involvement in the program.

Sensitivity Analysis

In the sensitivity analysis, the initial BMI z score of individuals who only attended an initial meeting were carried forward. Weight loss would be recommended for 330 participants, and 42% would have met this recommendation. Weight maintenance would be recommended for 19 individuals, and 84% would have met or exceeded this recommendation. Almost 45% of the participants included in the sensitivity analysis would have met or exceeded the recommendations of the panel at the end of their involvement in the program.

Change in Weight Category

Of the 12 participants who were overweight, 11 (92%) remained overweight and 1 (8%) was obese at the time of their last measurement. Of the 268 participants who were obese, 1 (0.4%) normalized their weight, 4 (1.5%) became overweight, and 263 (98.1%) remained obese at the time of their last measurement.

Discussion

This study evaluated a partnership between Tennessee Medicaid and WW for beneficiaries ages 10 to 17 who were referred by their health care providers to help manage their weight. Although the median change in BMI z score for the entire cohort was small at -0.02 , children and adolescents who attended the program for more than 12 weeks and those who attended 10 or more meetings had a 5% decrease in their BMI z score. Furthermore, even though the weight categories for most participants did not change over the course of the study, the weight change of 53% of participants either met or exceeded the

recommendations of the panel on childhood obesity at the end of their involvement in the program.

The change in BMI z score for the overall group was only -0.02 , and there are 2 possible reasons for this small reduction. First, the median duration of participation was short at 8.5 weeks. Children for whom weight maintenance is recommended are unlikely to have enough linear growth over such a short period of time to significantly lower their z score. The same might be true for a child who loses only a small amount of weight because they participated in the program for a short period of time. Second, as is true of adults in this and other weight loss programs, some of the participants in the current analysis gained weight.^{16,20,21} Therefore, the aggregate weight loss is modest. Statistically significant changes in BMI z scores were more likely in girls than boys, but this likely due to the relatively small number of boys.

One way to measure the success of a weight loss program is to determine the percentage of people who move to a lower weight category. In our study, participants in the program who started at lower BMI percentiles achieved greater weight loss than those who started at the highest BMI percentiles. As shown in a previous study,²² excess weight in children becomes more difficult to control as they become heavier. The expert committee's recommendations give health care providers a practical way to identify, prevent, and treat overweight and obese children. This analysis suggests that the TennCare–WW partnership was associated with a majority of participants meeting the recommendations of the expert committee. Providers should therefore consider referring their patients to similar structured programs, but they may want to refer them to programs sooner in their treatment course when they will have a greater likelihood for success.

Clinically significant weight loss is difficult to define in the pediatric population because of their growth potential and because there is no agreed upon goal in the literature.²³ However, several studies have gathered data on changes in blood pressure and lipids. Collectively, these data indicate that, similar to the adult population, a 5% to 10% change in BMI z score is clinically significant.^{24–26} In this analysis, clinically significant BMI z score change was achieved by the 25% of the participants who participated in the program for more than 12 weeks.

The weight loss among children and adolescent participants in the TennCare Weight Watchers Partnership Program is similar to the weight loss among the adults who participated in this program. Twenty percent of the adults participating in this initiative lost 5% or more of their baseline weight.²¹ The fact that children are still growing makes it difficult to directly compare their weight change to adults, because weight loss is not recommended for all groups. However, a 5% weight loss for adults seems to be roughly equivalent to a 5% reduction in the z score for children.

As might be expected, duration of participation and attendance were strongly associated with success in weight loss. There was no statistically significant difference for the change in z score for those who participated for up to 4, 8, or 12 weeks. Clinically significant weight loss was only seen in the group that participated for greater than 12 weeks. The same is true

for attendance; only participants who attended 10 or more meetings had a clinically significant change in BMI z score. Those who participated for more than 12 weeks and those who attended more than 10 meetings may represent a subset of extremely motivated participants or parents.

This non-concurrent prospective cohort analysis of secondary data has several limitations. There was no protocol for the measurement of height or weight. The measure of height was self-reported, making it subject to self-reporting bias. Studies about the accuracy of self-reported height in adolescents have been mixed, with some showing that adolescents accurately report their heights,²⁷ while others demonstrate that adolescents either under- or over-estimate their heights.²⁸ In any case, this may have changed the rates of overweight and obesity in the current study. Height was also only reported at the first visit; therefore, some participants likely grew during their participation in the program; therefore, BMI z scores may have improved, but this cannot be confirmed with the current data. Weight was measured at the WW meeting just as it would be in any community WW meeting. Age was not available as birth date but rather birth year, which can lead to inaccuracy when determining BMI z scores and BMI percentiles. In addition, there is no control group, nor are there any follow-up data for those who only attended one meeting. There was also differential follow-up because individuals participated for different lengths of time and because some may have participated in WW beyond the length of the program.

Overall, this study is important in 3 ways. First, it shows that the TennCare Weight Watchers Partnership Program was associated with a majority of children and adolescents participants meeting or exceeding the Expert Committee's recommendations. Second, it shows that this type of partnership can give low-income families the opportunity to have their children participate in a structured, evidence-based program, with a good chance of success (particularly if children attend for 12 weeks or longer). Third, because the expert committee recommends weekly follow-up clinic visits for those children who require Comprehensive Multi-disciplinary Intervention,⁹ it offers a potentially less expensive option. The long-term effectiveness and cost-effectiveness of these types of programs still needs to be determined. In the short term, however, this partnership appears to contribute to reducing the trajectory of weight gain among overweight and obese low-income children and adolescents.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Supported in part by grants P30-DK-048520-16S1 (NSM), P30-DK-048520 (JOH), and AHA-10SDG2610292 (AGT). Analysis for the study was also funded in part by the Children's Outcomes Research on the Anschutz Medical Campus in Aurora, Colo. The authors acknowledge and thank Brenda Beaty, MS, for the analytic support she provided for this project.

References

1. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999–2010. *JAMA*. 2012; 307:483–490. [PubMed: 22253364]
2. Strauss RS, Knight J. Influence of the home environment on the development of obesity in children. *Pediatrics*. 1999; 103:e85. [PubMed: 10353982]
3. Samani-Radia D, McCarthy HD. Comparison of children's body fatness between two contrasting income groups: contribution of height difference. *Int J Obes (Lond)*. 2011; 35:128–133. [PubMed: 20567240]
4. Wang Y, Jahns L, Tussing-Humphreys L, et al. Dietary intake patterns of low-income urban African-American adolescents. *J Am Diet Assoc*. 2010; 110:1340–1345. [PubMed: 20800126]
5. Dammann K, Smith C. Food-related attitudes and behaviors at home, school, and restaurants: perspectives from racially diverse, urban, low-income 9- to 13-year-old children in Minnesota. *J Nutr Educ Behav*. 2010; 42:389–397. [PubMed: 20702141]
6. Kumanyika S, Grier S. Targeting interventions for ethnic minority and low-income populations. *Future Child*. 2006; 16:187–207. [PubMed: 16532664]
7. Guo SS, Wu W, Chumlea WC, et al. Predicting overweight and obesity in adulthood from body mass index values in childhood and adolescence. *Am J Clin Nutr*. 2002; 76:653–658. [PubMed: 12198014]
8. Freedman DS, Khan LK, Serdula MK, et al. The relation of childhood BMI to adult adiposity: the Bogalusa Heart Study. *Pediatrics*. 2005; 115:22–27. [PubMed: 15629977]
9. Barlow SE, Committee E. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics*. 2007; 120(suppl 4):S164–S192. [PubMed: 18055651]
10. National Survey of Children's Health. [Accessed January 4, 2013] Available at: <http://www.childhealthdata.org/docs/nsch-docs/tennessee-pdf.pdf>
11. Healthy Americans. [Accessed May 29, 2012] Trust for America's health: Tennessee's public health data. Available at: <http://healthyamericans.org/states/?stateid=TN#section=1,year=2009,code=undefined>
12. Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. US Department of Health and Human Services, Centers for Disease Control and Prevention; Atlanta, GA: 2007. Available at: <http://apps.nccd.cdc.gov/brfss/display.asp?yr=2007&state=TN&qkey=4409&grp=0&SUBMIT3=Go> [Accessed August 23, 2011]
13. TennCare. [Accessed November 16, 2010] TennCare budget—expenditures and funding sources: fiscal years 2006 and 2007. Available at: <http://www.tn.gov/tenncare/forms/budgetsfy0607.pdf>
14. Finkelstein EA, Fiebelkorn IC, Wang G. State-level estimates of annual medical expenditures attributable to obesity. *Obes Res*. 2004; 12:18–24. [PubMed: 14742838]
15. Enriquez, R. Evaluation of TennCare and Weight Watchers pilot program. Jan-Jun. 2006 (Internal TennCare document.)
16. Heshka S, Anderson J, Atkinson R, et al. Weight loss with self-help compared with a structured commercial program: a randomized trial. *JAMA*. 2003; 289:1792–1798. [PubMed: 12684357]
17. Weight Watchers. Weight Watchers meetings; 2011; Available at: <http://www.weightwatchers.com/plan/mtg/index.aspx>
18. Zelman, KM. [Accessed July 16, 2012] Weight Watchers Points Plus: diet review. Available at: <http://www.webmd.com/diet/features/weight-watchers-diet>
19. Centers for Disease Control and Prevention. [Accessed January 4, 2013] Growth chart training. Available at: <http://www.cdc.gov/nccdphp/dnpao/growthcharts/resources/sas.htm>
20. Mitchell NS, Dickinson LM, Kempe A, et al. Determining the Effectiveness of Take Off Pounds Sensibly (TOPS), a nationally available nonprofit weight loss program. *Obesity (Silver Spring)*. 2011; 19:568–573. [PubMed: 20864948]
21. Mitchell NS, Ellison MC, Hill JO, Tsai AG. Evaluation of the Effectiveness of Making Weight Watchers Available to Tennessee Medicaid (TennCare) Recipients. *J Gen Intern Med*. 2013; 28:12–17. [PubMed: 22618582]

22. Epstein LH, Valoski AM, Kalarchian MA, et al. Do children lose and maintain weight easier than adults: a comparison of child and parent weight changes from six months to ten years. *Obes Res.* 1995; 3:411–417. [PubMed: 8521160]
23. Kalavainen MP, Korppi MO, Nuutinen OM. Clinical efficacy of group-based treatment for childhood obesity compared with routinely given individual counseling. *Int J Obes (Lond).* 2007; 31:1500–1508. [PubMed: 17438555]
24. Kirk S, Zeller M, Claytor R, et al. The relationship of health outcomes to improvement in BMI in children and adolescents. *Obes Res.* 2005; 13:876–882. [PubMed: 15919841]
25. Krebs NF, Gao D, Gralla J, et al. Efficacy and safety of a high protein, low carbohydrate diet for weight loss in severely obese adolescents. *J Pediatr.* 2010; 157:252–258. [PubMed: 20304413]
26. Kolsgaard ML, Joner G, Brunborg C, et al. Reduction in BMI *z*-score and improvement in cardiometabolic risk factors in obese children and adolescents. The Oslo Adiposity Intervention Study—a hospital/public health nurse combined treatment. *BMC Pediatr.* 2011; 11:47. [PubMed: 21619652]
27. Morrissey SL, Whetstone LM, Cummings DM, et al. Comparison of self-reported and measured height and weight in eighth-grade students. *J Sch Health.* 2006; 76:512–515. [PubMed: 17096824]
28. Sherry B, Jefferds ME, Grummer-Strawn LM. Accuracy of adolescent self-report of height and weight in assessing overweight status: a literature review. *Arch Pediatr Adolesc Med.* 2007; 161:1154–1161. [PubMed: 18056560]

What's New

Overweight and obese children in low-income households can meet or exceed the Expert Committee Regarding the Prevention, Assessment, and Treatment of Childhood and Adolescent Overweight and Obesity Recommendations when given access to a structured, evidence-based weight loss program.

Figure 1.
Selection of study participants and description of study population.

Figure 2.
Change in median body mass index z score by weeks of Weight Watchers participation.

Table 1

Participant Baseline Characteristics

Characteristic	Total	Male	Female	P Value
No. of subjects	280	79 (28%)	201 (72%)	
Age, y				
Median (25%–75%)	14.5 (12.5–15.5)	13.5 (11.5–14.5)	14.5 (12.5–15.5)	.0004
Range	10.0–17.5	10.0–17.5	10.0–17.5	
BMI z score				
Median (25%–75%)	2.40 (2.15–2.57)	2.51 (2.31–2.66)	2.34 (2.12–2.53)	.0001
Range	1.21–3.20	1.49–3.20	1.21–3.05	
Duration of participation in WW				
4 wk	76 (27)	18 (23)	58 (29)	.76
>4 to 8 wk	62 (22)	21 (27)	41 (20)	
>8 to 12 wk	73 (26)	21 (27)	52 (26)	
>12 wk	69 (25)	19 (24)	50 (25)	
No. of WW meetings attended				
2–3	67 (24)	17 (22)	50 (25)	.76
4–6	82 (29)	29 (37)	53 (26)	
7–9	54 (19)	11 (14)	43 (21)	
10+	77 (28)	22 (28)	55 (27)	

BMI = body mass index; WW = Weight Watchers.

Table 2Change in Median BMI z Score Based on Duration of Participation in Weight Watchers, Stratified by Sex

Duration of Participation	n (%)	Median (25%, 75%) BMI z Score Difference	<i>P</i> Value *
Total	280 (100)	−0.02 (−0.07, 0.00)	<.0001
Male	79	−0.02 (−0.08, 0.01)	.0002
Female	201	−0.03 (−0.07, 0.00)	<.0001
4 wk	76 (27)	−0.01 (−0.03, 0.01)	<.0001
Male	18	−0.01 (−0.04, 0.01)	.50
Female	58	−0.01 (−0.03, 0.00)	<.0001
>4 to 8 wk	62 (22)	−0.01 (−0.04, 0.01)	.02
Male	21	−0.00 (−0.05, 0.01)	.30
Female	41	−0.01 (−0.04, 0.01)	.04
>8 to 12 wk	73 (26)	−0.02 (−0.08, 0.01)	.0004
Male	21	−0.02 (−0.05, 0.01)	.13
Female	52	−0.02 (−0.09, 0.01)	.002
>12 wk	69 (25)	−0.09 (−0.17, −0.03)	<.0001
Male	19	−0.10 (−0.28, −0.03)	.002
Female	50	−0.07 (−0.16, −0.03)	<.0001

BMI = body mass index.

* *P* values reflect comparison between BMI z score at first and last visit within group.

Table 3Change in BMI z Score Stratified by Number of WW Meetings Attended and Sex

No. of WW Meetings	n (%)	Median (25%, 75%) BMI z Score			<i>P</i> Value
		At First Visit	At Last Visit	Difference	
2–3	67 (24)	2.35 (2.11, 2.51)	2.32 (2.09, 2.50)	−0.01 (−0.03, 0.01)	<.001
Male	17	2.52 (2.43, 2.63)	2.49 (2.42, 2.61)	−0.01 (−0.04, 0.01)	.22
Female	50	2.27 (2.04, 2.43)	2.27 (2.03, 2.43)	−0.01 (−0.03, 0.00)	<.001
4–6	82 (29)	2.42 (2.17, 2.64)	2.39 (2.12, 2.62)	−0.01 (−0.05, 0.01)	<.001
Male	29	2.50 (2.24, 2.70)	2.56 (2.24, 2.69)	0.00 (−0.05, 0.01)	.44
Female	53	2.32 (2.15, 2.61)	2.33 (2.09, 2.56)	−0.02 (−0.05, 0.00)	<.001
7–9	54 (19)	2.42 (2.17, 2.62)	2.43 (2.19, 2.58)	−0.02 (−0.08, 0.01)	.004
Male	11	2.56 (2.31, 2.66)	2.54 (2.27, 2.71)	−0.01 (−0.04, 0.01)	.28
Female	43	2.39 (2.14, 2.62)	2.37 (2.11, 2.57)	−0.02 (−0.09, 0.01)	.009
10+	77 (28)	2.41 (2.18, 2.56)	2.30 (2.02, 2.51)	−0.07 (−0.16, −0.02)	<.001
Male	22	2.51 (2.15, 2.65)	2.31 (2.11, 2.58)	−0.09 (−0.26, −0.04)	.0005
Female	55	2.37 (2.18, 2.54)	2.27 (1.99, 2.50)	−0.06 (−0.16, −0.01)	<.001

WW = Weight Watchers; BMI = body mass index.

Table 4

Weight Change Compared With Expert Committee Recommendations by Weight Status for Participants Aged 10–17 Years

Weight Status (BMI Percentile)	n	Recommendation	Lost Weight, n (%)	Maintained Weight, n (%)	Gained Weight, n (%)
Overweight (85 to <95)	12	Weight maintenance	8 (67)	1 (8)	3 (25)
Obese (95 to <99)	103	Weight loss	54 (52)	17 (17)	32 (31)
Severely obese (99)	165	Weight loss	86 (52)	24 (15)	55 (33)

BMI = body mass index.